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## ABSTRACT

A citation analysis study examined the nature of sources cited in the articles published in five volumes of the "Journal of Agricultural Education" (JAE) during the decade 1980-1990. Information was sought concerning the citation structure of the JAE over the 10-year period, the relative importance of types of citations referenced by authors publishing articles in the JAE, and the structure of the agricultural and extension discipline as indicated by self-identity and compactness. A systematic sample of 19 issues comprising 162 articles was analyzed to accomplish the study objectives; citations were categorized according to Goldsmith's (1983) research. Some of the results of the study were the following: (1) the number of articles and the number of citations used have increased over the years, with the mean number of citations per article more than doubling; (2) agricultural educators are most likely to quote information from journals (26 percent), followed by books (24 percent), bulletins and reports (23 percent), dissertations and theses (13 percent), and magazines and conference proceedings (8 percent); (3) the use of journals, books, bulletins and reports, dissertations and theses, and conference proceedings has increased over the years, and the use of magazines has declined; and (4) frequent citation of the same journals reveals that the discipline of agricultural education research appears to have a strong self-identity and that it is compact. The study concluded that agricultural educators and the JAE should branch out by conducting and publishing research in nontraditional areas of agricultural education and by examining and citing more research conducted in other disciplines. (Contains 18 references.) (KC)

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## CHARACTERISTICS OF LITERATURE CITED IN THE *JOURNAL OF AGRICULTURAL EDUCATION*: AN EMPIRICAL STUDY

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### INTRODUCTION

Thirty-one volumes of the *Journal of Agricultural Education* (formerly *AATEA Journal*) have been published since 1961. Over the years, the journal has undergone a number of changes in terms of size, format, content, frequency of publishing (from three issues to four in 1983) and finally, a change in the name from *AATEA Journal* to the *Journal of Agricultural Education*.

During the *Journal's* span of 31 years, a number of researchers have examined various research and publishing aspects in the agricultural education profession. The most prominent subjects discussed included: empirical analysis of the *Journal of Agricultural Education* during the eighties (Radhakrishna and Jackson, 1992); what topics were cited and who was cited (Moore, 1991); reader opinions of the *JAE* (Newman, 1990 & Williams, 1982); statistical procedures used by agricultural educators in reporting research findings (Bowen, Rollins, Baggett & Miller, 1990; Mannebach, McKenna & Pfau, 1984; and Warmbrod 1986); and agricultural and extension education research published in terms of program area, area of focus, and scope (Crunkilton, 1988).

Researchers in other disciplines have also examined research and publishing aspects within their profession. The most notable publications reviewed included: the *Journal of Consumer Research* (Wind, 1977), the *Journal of Marketing Research* (Goldman, 1979), *Journal of Applied Psychology* (Cox, 1977) and *Home Economics Research Journal* (Goldsmith, 1983). Although the scholars in the agricultural education profession have addressed research and publishing activities in a variety of ways, literature is scarce with studies that analyzed the citation characteristics of agricultural educators. "Citations are a popular indicator of the behavior of scholars because they reflect on author's debt to earlier works, constitute a statement as to which of these works are important, and are a means by which authors anchor their work and relate it to earlier research" (Goldman, 1979, p. 485). In addition, citations may also reflect an author's scope of reading and their scientific interests (Berg, 1971; Broadus, 1967; & Crane, 1972).

A number of researchers in various scientific disciplines have considered citation structure as a good indicator of the nature of scientific activity. In addition, citation structure also characterizes a field of study, defines its boundaries, and explains how a discipline is interrelated with other fields of study (Narin, Carpenter and Berit, 1972). Prominent among the scholars who have analyzed citation structures within their discipline include: Goldman (1979)--*Journal of Marketing Research* and *Journal of Marketing*, Broadus (1952)--*American Sociological Review*, Hamelman, Edward & Mazze (1972)--*Finance Journals*, and Goldsmith (1983)--*Home Economics Research Journal*. These studies have concluded that scientists use various methods to disseminate their research findings. Journals and books were the most widely used methods for communicating research findings, followed by working papers, presentations at research meetings and conference proceedings.

Findings from these studies also indicated that publications such as *Journal of Marketing Research* and *Journal of Marketing*, *American Sociological Review* and *Finance Journals* have a greater degree of self-identity than that of *Home Economics Research Journal*. A discipline is considered to have strong self-identity and compactness if a large proportion of the citations are concentrated in journals related to that area or field of study (Goldman, 1979). For example, Goldman (1979) reported that 41.5% of all citations in the marketing discipline were concentrated in two journals, ie, *Journal of Marketing Research* and *Journal of Marketing* whereas, only 16% of

the citations in the home economics discipline were from its two major journals, *Home Economics Research Journal* and *Journal of Home Economics*.

### OBJECTIVES

In this paper, the researchers have attempted to examine the nature of sources cited (citation analysis) by the authors of articles published in five volumes of the *JAE* during the decade 1980-90. The objectives of the study were:

1. To determine the citation structure of the *JAE* over a 10 year period.
2. To determine the relative importance of types of citations referenced by authors publishing articles in the *JAE*.
3. To determine the structure of the agricultural and extension education discipline as indicated by self-identity and compactness.

### PROCEDURES

A census of all articles published in the *Journal of Agricultural Education (JAE)* during the decade 1980-90 was considered for this study. Then, using a systematic sampling procedure, every 2nd year in the decade was selected for analysis. This resulted in the selection of the years: 1982, 1984, 1986, 1988, and 1990.

A total of 19 issues and 162 articles were analyzed to accomplish the study objectives. The selection of this decade and years for analysis was based on three criteria. First, the journal changed its publication from three to four issues per year, thus becoming a quarterly. Second, a scientific journal reflects the tastes and preferences of the editor, and the reviewers, as well as editorial policies. The *JAE* had three editors during this decade: John Hillison (1982-84), Kirby Barrick (1985-1988), Philip Buriak (1989-1991). And third, the *Journal* changed its name from *Journal of AATEA* to *Journal of Agricultural Education (JAE)* in 1988.

For categorizing citations, the classification of citations by Goldsmith (1983) was consulted. Goldsmith's classification includes: books, journal articles, doctoral dissertations/master's theses, conference proceedings and paper presentations, magazines, and bulletins and reports. Goldsmith's classification of citations was slightly modified to reflect our study needs. For example, dissertation abstracts were included in the dissertation and master's theses category. Staff studies, summary research reports, and ERIC documentation abstracts were included in the bulletin/reports category. The total number of citations per article, per issue, and per year were also determined. In addition, it was also determined how many citations were from the following types of publications: books, journal articles, doctoral dissertation and master's theses, paper presentations and conference proceedings, bulletins and reports. Frequencies, percentages and means were used to describe the data.

### RESULTS

#### Research Question # 1

Scientists use a variety of methods to communicate their research findings. Thus, an attempt was made in this study to examine what sources agricultural educators are reading and using in their research. Data suggests that the mean number of articles cited has increased over the decade indicating a greater breadth of knowledge and reading among agricultural educators. Similarly, the number of articles published and the number of citations used has also increased over the years. During the sample years, the number of citations ranged from 4.52 per article in 1982 to 11.2 in 1990, with an overall mean of 9.2. Furthermore, it appears that agricultural

educators tend to refer fewer citations per article (9.2) as compared to home economists (16.9) (Goldsmith, 1983).

**Table 1**  
**Average Number and Distribution of Articles and Citations by Year and Total (1980-90)**

|                                         | YEAR |      |      |       |       | Total |
|-----------------------------------------|------|------|------|-------|-------|-------|
|                                         | 1982 | 1984 | 1986 | 1988  | 1990  |       |
| Number of Articles                      | 19   | 33   | 35   | 30    | 45    | 162   |
| Number of Citations                     | 86   | 224  | 314  | 332   | 506   | 1462  |
| Average Number of Citations Per Article | 4.52 | 6.79 | 8.97 | 11.06 | 11.24 | 9.02  |

### Research Question #2 & 3

Agricultural educators are most likely to quote information from journals (26%), followed by books (24%), bulletins and reports (23%), dissertation and theses (13%), magazines and conference proceedings (8.3%). The use of journals has increased over the years. Similarly, the use of books, bulletins/reports, dissertations/theses and conference proceedings has increased. However, the findings indicate a decline in the use of magazines by agricultural educators.

**Table 2**  
**Number and Percentage Distribution of Citations by Type, Year and Total (1980-90)**

| Citation Type       | YEAR |      |      |      |      | Total | Percent |
|---------------------|------|------|------|------|------|-------|---------|
|                     | 1982 | 1984 | 1986 | 1988 | 1990 |       |         |
| Journals            | 18   | 41   | 69   | 87   | 162  | 377   | 26.0    |
| Books               | 13   | 57   | 94   | 73   | 119  | 356   | 24.0    |
| Bulletins/Reports   | 28   | 57   | 59   | 79   | 112  | 335   | 22.9    |
| Dissertation/Theses | 23   | 39   | 33   | 38   | 54   | 187   | 13.0    |
| Magazines           | 1    | 24   | 46   | 32   | 19   | 122   | 8.3     |
| Papers/Proceedings  | 3    | 6    | 13   | 23   | 40   | 85    | 5.8     |

Since more than 25% of the sources cited by agricultural educators are from journals, it is important to know what journals are being used by agricultural educators. The *Journal of Agricultural Education* (22.5%) is the most often cited, followed by *Educational and Psychological Measurement* (5.4%), and *Journal of Extension* (5.3%). Findings also indicate that agricultural educators often cite journals from other disciplines, which indicates the interdisciplinary nature and diversity of the profession's research and reading characteristics.

The journals used by scholars and the nature of citation distribution are two key factors that determine the structural aspects of a discipline. Further, if a discipline has a strong self-identity, the researchers in that discipline build on each other's work. According to Crane (1972), extensive cross-referencing by authors in the same area indicates internal bonds, which reflects the structure and identity of a discipline. Similarly, if publications in a discipline are easy to locate because they only appear in a few journals, the discipline can be considered "compact." Greater compactness contributes to a stronger internal structure and self-identity in a discipline (Goldman, 1979, p. 489).

**Table 3**  
**Number, Percentage and Rank Ordering of 10 Most Cited Journals by Year and Total**

| Journal                                            | YEAR |      |      |      |      | Total | Percent/Rank |
|----------------------------------------------------|------|------|------|------|------|-------|--------------|
|                                                    | 1982 | 1984 | 1986 | 1988 | 1990 |       |              |
| <i>J. of Agricultural Education</i>                | 3    | 13   | 13   | 22   | 34   | 85    | 22.5/1       |
| <i>Educational &amp; Psychological Measurement</i> | 1    | 2    | 2    | 3    | 12   | 20    | 5.4/2        |
| <i>J. of Extension</i>                             | 3    | -    | 2    | 8    | 6    | 19    | 5.3/3        |
| <i>J. of Teacher Education</i>                     | -    | 1    | 3    | 3    | 8    | 15    | 3.9/4        |
| <i>J. of Applied Psychology</i>                    | -    | 2    | 5    | 1    | 2    | 10    | 2.6/5        |
| <i>J. of Vocational Education Research</i>         | -    | 1    | -    | 3    | 6    | 10    | 2.6/5        |
| <i>American Vocational Journal</i>                 | -    | 1    | 4    | -    | 3    | 8     | 2.1/6        |
| <i>NACTA Journal</i>                               | 1    | 2    | -    | 1    | 3    | 7     | 1.8/7        |
| <i>Administrative Science Quarterly</i>            | -    | 4    | 3    | -    | -    | 7     | 1.8/7        |
| <i>Educational Researcher</i>                      | -    | -    | 1    | 2    | 3    | 6     | 1.6/8        |
| <i>Adult Education</i>                             | -    | 4    | -    | 2    | -    | 6     | 1.6/8        |
| Other Journals                                     | 10   | 11   | 36   | 42   | 85   | 184   | 48.8         |

The discipline appears to have a strong self-identity, which suggests that agricultural educators tend to build on each other's work. In addition, the agricultural education discipline is compact because most of the listed citations are concentrated in three specific journals, the *Journal of Agricultural Education*, *Journal of Extension* and *Educational and Psychological Measurement*.

#### CONCLUSIONS AND/OR RECOMMENDATIONS

Journal analysis can provide a means of assessing key factors that usually indicate the research and publishing characteristics of a profession. This study attempted to identify the characteristics of literature cited by agricultural educators in the *Journal of Agricultural Education*. Agricultural educators tend to cite journals, followed by books, and reports.

The discipline of agricultural education appears to have a strong self-identity and compactness. This finding suggests that the *Journal's* editorial and review boards should consider expanding the scope and breadth of the publication. This expansion should involve publishing research studies conducted in "non-traditional" topics that are currently pursued by many agricultural educators. According to Bowen, Radhakrishna, and Jackson (1991), agricultural and extension education faculty have been distributing more of their time to activities that have not traditionally been included in *JAE*. Bowen, et. al. (1991) reported that the respondents to an agricultural and extension education faculty survey indicated that they were devoting more time to extension education (18.8%), administration (27.1%), and international agricultural education (8.6%) activities.

Agricultural education's narrow focus has been previously addressed by scholars, such as Warmbrod (1986), who indicated that despite the fact that agricultural education research has "made great strides" during last two decades, we must concentrate on building a stronger conceptual/theoretical framework. Moore (1991) indicated that the profession must be on a continuous spiral upward and conduct more theory building research. He also suggested that both faculty and graduate students should seriously consider the scope and importance of their research topics before publishing.

On the basis of the data collected in this study, agricultural educators and the *Journal of Agricultural Education* Editorial and Review Board must "branch out" by conducting and publishing research in non-traditional areas of agricultural education. The profession must also examine and cite more research conducted in other disciplines and incorporate those findings, conclusions and recommendations in order to build a stronger framework and continue broadening our focus and breadth of knowledge.

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